number of English and American mining engineers who will appreciate a good dictionary of mining terms, and certainly the author has spared no pains to make his dictionary as complete as possible. He has diligently studied the Spanish literature of mining and metallurgy, and his long residence in Mexico and in the United States of Colombia has enabled him to include a very full list of the terms used in these republics. Some Portuguese and Brazilian terms are also added.

It is curious to note that many terms have different meanings in different districts of South America. Thus, the well-known term *Caliche*, applied in Chile and Peru to the impure native nitrate of soda which is mined on a vast scale, denotes in the Uco district of Peru a thin layer of clayey soil capping auriferous veins, in Mexico felspar, and in Antioquia, Colombia, a recently-discovered mineral vein. It is probable that with the development of railway intercommunication many of these terminological differences will disappear, and that the most convenient terms will survive. In all cases the locality where a particular term is in use is noted by the author, and the authority is duly recorded. Small sketches, seventy-six in number, are added when necessary to elucidate a definition. The whole work has been compiled with scrupulous accuracy, and deserves unstinted praise. It is perhaps to be regretted that an English index to the Spanish terms has not been included in the scheme of the work.

Immanuel Kants Metaphysik der Sitten. Herausgegeben von Karl Vorländer. Price 4.60 marks.

Kirchners Wörterbuch der philosophischen Grundbegriffe. Neubearbeitung von Dr. Carl Michaëlis. Price 8 marks.

B. de Spinoza's kurzgefasste Abhandlung von Gott, dem Menschen und dessen Gluck. Übersetzt von C. Schaarschmidt.

G. W. F. Hegel's Phänomenologie des Geistes. Jubiläumsausgabe. Herausgegeben von Georg Lasson. Price 5 marks. (Leipzig: Durr'schen Buchhandlung, 1907.)

THE first three of these volumes are new editions of works that have been reprinted at various times in the "Philosophische Bibliothek," a series which does for the German student of philosophy what Ostwald's well-known "Klassiker der exakten Wissenschaften" do for the German student of the sciences. Hegel's famous treatise has been added to the series in celebration of the centenary of its original publication in 1807.

The books are admirably printed, and are provided with excellent introductions, often by men of first-rate authority. Many of them are, in addition, briefly but helpfully annotated, while most are equipped with a useful index. More conspicuously moderate in price even than Ostwald's reprints, these wonderful volumes, by their very existence, render almost unthinkable any English series comparable with them in scope and importance.

The Spectroscope: its Uses in General Analytical Chemistry. By T. Thorne Baker. Pp. viii+130. (London: Baillière, Tindall and Cox, 1907.)

THIS volume contains a fair amount of information useful to those wishing to purchase and set up spectroscopic apparatus for chemical research, but it seems to us to be ill-assorted and indifferently arranged. The author plunges straightway into the elementary mathematics of the prism and plane and concave gratings, and then describes the various parts of spectroscopes; yet on p. 78 it is thought necessary to inform the reader that a 12-inch focus telescope lens will give a much shorter spectrum than an 18-inch focus lens. There are, however, in the various discourses on adjustments, refractive indices, resolving power, the methods of producing radiation, sensitive plates, &c., numerous hints which will be found useful by those who have only a general knowledge of physics and wish to take up spectroscopy. It is for such readers that the book is intended. The notes on "series" and the Zeeman effect would probably be better left to the more advanced works on spectroscopy. There are a few uncorrected misspellings and one or two curious terms, which suggest that the author's acquaintance with real, practical laboratory work has been either too brief or too restricted. The astrophysical side of the subject is not dealt with at all, the idea being to restrict the book entirely to the chemical side. W. E. R.

Der Bedeutung der Reinkultur. Eine Literaturstudie. By Dr. Oswald Richter. Pp. viii+128. (Berlin: Gebrüder Borntraeger, 1907.) Price 4.40 marks.

THIS essay, with true German thoroughness, gives a very complete, though necessarily brief, survey of the various microscopic organisms that have been obtained in pure cultivation. The organisms are dealt with in groups (and not individually), partly according to their biological position, partly according to the changes they produce. The green and blue algæ and diatoms are first considered, then the bacteria—the nitrifying forms, cellulose fermenters, sulphur bacteria, &c.—and lastly the yeasts and protozoa. In the final portion of the book the subjects of pleomorphism and systematic position of these organisms are discussed. The bibliography is a very full one, and it is probable that this part of the compilation will be most appreciated. R. T. H.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Coloration of Birds' Eggs.

IN NATURE of May 14 Mr. R. L. Leslie asks if it is known how and why birds' eggs become coloured, and whether they illustrate Mendelian phenomena.

Something is known as to the nature of the pigments from which the colours are derived. The late Dr. H. C. Sorby in 1875 investigated their origin by means of the spectrum analysis. He discovered seven substances in the pigments accounting for every form of coloration. These substances are oorhodeine (red), oocyan, banded ooycan (blue), yellow ooxanthine, rufous ooxanthine (yellow and reddish-yellow), a sixth substance of a brown tint, and lichenoxanthine, found in many plants, lichens, and fungi, and perhaps due to microscopic fungi. According to older theories, the pigments were secretions from the blood and bile, and in the case of the first three Sorby was disposed to agree (*cf.* the origin of pigments in coloration of molluscan shell). The ground-colour is laid on the shell just before the extrusion of the egg, and in eggs not of a purely uniform colour the markings are then superposed, being originally rounded, but by movement of the bird they become blurred and blotched. The intensity of coloration varies with age up to a certain point. Eggs of young birds are often unspotted. No doubt absence of markings is due to deficiency of pigmentation. The last egg or eggs of a second brood, in fact, often lack normal coloration or markings. Age and health thus control coloration, which is brilliant in a healthy but indistinct in an unhealthy bird's egg. Whether albino birds lay eggs differing from those of birds typical in every way has not been noticed apparently.

Little is known definitely as to why eggs are coloured.

In the early days of ornithology oology played its part in classification, but though the eggs of plovers, gulls, &c., characterise their suborders, this is rather exceptional than otherwise, and Huxley has settled the question of avian taxonomy upon a sound morphological basis. Coloration of eggs seems to have no connection with inherent hereditary tendencies, nor is it apparently the result of acquired characters in the birds themselves. In a large number of cases it can be traced to the necessity for a protective resemblance, just as in shells of mollusca. This would serve to ensure escape from the jaws or beaks of natural enemies, *e.g.* hedgehog, snakes, and egg-sucking birds and mammals, or (in recent times) from the collecting instinct of man. Where eggs exhibit brilliant or conspicuous markings, for no purpose apparently, we may perhaps assume that the nesting-site has been modified, or that, like the colour of the plumage, that of the egg is a source of attraction, and connected with courtship, or, more probably, as a means of identification by the individual of its own nest and eggs, when the process would naturally be hereditary (memory and heredity being intimately allied), the instinct employed in distinguishing similar clutches characterised by merely slight differences being likewise acquired.

No two clutches of eggs of the same species are exactly alike, particularly amongst birds nesting in colonies, *e.g.* guillemots, penguins, &c., but each bird knows its own egg. A few general principles may be recognised in the coloration of birds' eggs. Usually white eggs are laid by birds nesting in holes in trees or in dark situations, where light seldom penetrates, as by the barn owl, woodpeckers, and some pigeons, which build sometimes in the open, though usually in dark woods (wood-pigeon), sometimes in holes in trees, or in rabbit-burrows (stock-dove). Though all owls lay white eggs, not all of them nest in holes in trees, *e.g.* long-eared owl, snowy owl. This rule, then, holds good in a large number of cases, but not invariably. Most birds nesting on or near the ground lay eggs of a uniform olive-green or brown ground-colour, *e.g.* pheasant, partridge, nightingale, &c., the eggs harmonising with the ground or vegetation.

The eggs of grouse, ptarmigan, &c., resemble the heather amongst which they are hid. Those of the ringed plover, little tern, and oyster-catcher resemble sand and shingle on the beach. The lapwing's eggs closely simulate bare soil or dried bents. In these eggs secondary markings break up the ground-colour, and further help to render the eggs quite invisible except to an eye trained to detect slight differences. The experienced field naturalist can find his way to the immediate whereabouts of a nest by noticing the existence of some distinctive mark in the surroundings, *e.g.* a stick, boulder, bush, mole-heap, &c., indicating to the birds themselves at a distance the vicinity of the nest, and thus enabling them to return quickly and stealthily without laying themselves open to observation by long searching for the nest. The same protective resemblance occurs amongst the chicks of these birds. Adaptation to external surroundings, now or in the past, seems to explain this matter of coloration in a large number of cases, and exceptions to the rule are usually simply examples of reversions to, or rather survivals of, ancestral traits before protection was called for. In seeking for the causes of variation, &c., the influence of environment or external conditions seems to have been largely overlooked, too great prominence having been given to the influence of the inherent tendency to vary. In the case of the colours of birds' eggs we have an instance in which, I think, external conditions have played the greatest part.

Whether all birds' eggs were originally white, and the pigmentary layer has since been added to aid in concealment or to counteract the heat of the sun's rays, is not definitely known. The number of eggs ornamented with spots, &c., is very great. The creepers, nut-hatch, &c., lay spotted eggs in holes in trees, &c., possibly after originally having had some other nesting-site.

Summing up the general conclusions drawn from the coloration of birds' eggs, we find different species of birds of the same genus in a large number of cases lay eggs of much the same type, *e.g.* warblers, tits, nut-hatches, creepers, plovers, ducks, pigeons, gulls, terns, &c. In very many cases, however, this is not the case, and an exception in any genus may generally be traced to influence of environment. Amongst the Turdidæ, the eggs of the missel-thrush, thrush, and blackbird are very dissimilar, though their nesting sites are much alike. Variation in the colours of eggs goes, in fact, largely with difference in nesting-site. The starling and jackdaw lay blue eggs like the three last-named birds in holes in trees. Probably these birds have only recently betaken themselves to such nesting quarters. The influence of man and his habitations, and the conversion of dark forests into fields simply enclosed with *lines* of trees into which light readily penetrates, may have induced alterations in some instances, if not in coloration of the egg, at least in nesting-sites, of many birds intimately associated with human undertakings.

A. R. HORWOOD.

Leicester Corporation Museum, May 26.

Electrical Action of Sodium.

IN a recent letter (NATURE, May 28) I directed attention to the fact that a negatively electrified body lost its charge in air when held near to a clean surface of sodium.

I have now ascertained that different portions of the same rod may show the effect to a greater or less extent owing to inequalities of temperature. Diminishing the oxidation by cooling the metal produced a more complete diselectrification, and this result seemed, at first sight, to point to a cause other than chemical action. The influence of a current of air, as well as the fact that even a soap film stopped the discharging action, supported the view that an electrified gas was emanating from the metal. A bright surface of potassium gave no appreciable discharging effect when cooled with a mixture of ice and salt. In all cases the surfaces could be seen in the dark to be glowing strongly.

Further experiment has shown that no active gas can be driven from sodium by heat, and that the true explanation of the action lies in the positive electrification of the air surrounding the freshly cut surface. With warm sodium it is seen that the gold leaf falls rapidly for a very short distance, while after cooling the action is more prolonged. It is clear, therefore, in the first case, that the action, although violent, is so transient, owing to the whole surface being rapidly oxidised, as to appear of small amount. The far larger discharging action was obtained with reduced oxidation owing to the effect being more prolonged.

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Tabular Accuracy.

I DO not know whether you will consider the following suggestion suitable for publication. Though obvious, I do not remember meeting with it.

All are agreed upon the enormous importance of securing accuracy in mathematical tables, and of making known any errors, but I am not aware of any definite centralised method of registering mistakes, and publishing, in an easily accessible form, corrections of them.

What I venture to suggest is that, in connection, say, with the National Physical Laboratory, there should be a department dealing with mathematical tables. When an error is discovered in any recognised table, the discoverer should at once send a note of the fact to this department, which would duly investigate the matter. Then, at suitable intervals, the department would publish a list of errors, with their corrections, in a form purchasable by those interested. By some such arrangement he might hope in time to secure the accuracy so essential to the numerical data employed in scientific calculations.

C. T. WHITMELL.

Invermay, Hyde Park, Leeds, June 2.

The "Sky-coloured Clouds."

THERE was a very feeble display of "sky-coloured clouds" here on May 27 from 10 to 11.15 p.m. This is the first time I have seen this phenomenon since July 19, 1906. Since May 27 the sky has not been clear enough for them to be visible.

T. W. BACKHOUSE.

West Hendon House, Sunderland, June 4.